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Law Offices of Boris G. Tankhilevich
Suite A
536 N. Civic Drive
Walnut Creek, CA 94597

EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2611	

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

RP

Office Action Summary	Application No.	Applicant(s)
	10/734,415	ISAKSEN ET AL.
	Examiner	Art Unit
	Curtis B. Odom	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *26-29 and 36-40* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 30-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-25 and 30-35 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 1-25 are objected to because of the following informalities: In claims 1-25, it is suggested the step references (A, B, A1, B1) be deleted. For example, in claim 4 step "A2" should be step "A1" since it corresponds directly to step "A". If claim 4 were to depend upon claim 2 or claim 3, then the step should be labeled "A2". If it is a different mode, then the claim should read "mode A1" or "mode A2" to indicate the different modes of the state machine. Otherwise it is the understanding to the examiner that "A1" and "A2" are different steps within step "A".

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 3, 12-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 recites the limitation "causing said state machine to enter state "1A", wherein said state machine employs a minimum number of symbols to transition from said state "1A" to a next state". Claim 12 recites the limitation "causing said state machine to enter state "5A", wherein said state machine transitions from said state "5A" to a next state" by employs a minimum number of symbols. However, the claims do not define what is included in states "1A" and "5A". Rather, the states simply define how to transition from one state to the next state.

Claim 14 recites the limitation "causing said state machine to enter state"5B", wherein state "5B" corresponds to a "maximum number of Quadrature Amplitude Modualtion (QAM) symbols" mode of said state machine". However, the claim does not define a function of state "5B". Rather, the claim describes the mode of the state machine, but does not describe the functions performed by the state machine in state "5B". There is a maximum number of symbols, but the claim does not define a function for the maximum number of symbols in state "5B". Further, it is the understanding of the examiner, that employing a maximum number of symbols in state "5B" simply transitions the state machine to a new state (see instant specification, page 34, lines 1-5) and is not a function of state "5B".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (previously cited in Office Action 5/11/2006) in view of Yoshihara (U. S. Patent No. 4, 871, 973).

Regarding claim 30, de Lantremange discloses an apparatus (Fig. 1A and 1B) for automated acquisition of a QAM signal column 1, lines 13-17 and column 6, lines 6-15, wherein reception is acquisition), the apparatus employing a state machine (Fig. 1A, Table 2, column 25, lines 21-46) progressing from an initial state (STATE 0) to a final state (STATE 6); the apparatus comprising:

Fig. 1A, block 28, column 7, lines 33-46 which corresponds to a means for performing an automatic gain control (AGC) operation on the incoming QAM signal to maintain a steady amplitude (wherein magnitude is equivalent to amplitude) of the QAM signal;

Fig. 1A, blocks 24, 26, 32, 34, and 36, column 17, lines 11-17 disclose a timing recover loop for adjusting timing of a sampling clock (wherein compensating for offsets of the sampling clock allows timing recovery as disclosed in column 12, lines 31-41) which corresponds to a means for performing a symbol timing recovery of the input QAM signal;

Fig. 1A, block 32, column 8, lines 35-67 discloses a self- recovering adaptive feed-forward filter using a blind algorithm corresponding to a means for performing a Blind Equalization (wherein the blind algorithm used to update coefficients corresponds to a blind

equalization operation) of the QAM signal without carrier lock (wherein there is no disclosure of locking the carrier) to minimize a dispersion error (see column 10, lines 1-14) of the received QAM signal constellation as compared with an error-free QAM signal constellation (wherein the dispersion error is minimized to match output of the modulator shaping filter (error-free signal constellation) with output of the adaptive filter as described in column 1, lines 58-67);

Fig. 1B, column 19, line 54-column 20, line 27 discloses compensating for phase and timing (frequency) offsets of the carrier to recover the carrier which corresponds to a means for performing a carrier recovery of the QAM signal to eliminate a residual carrier frequency error and to eliminate a phase error (see column 19, lines 54-64) from the acquired QAM signal; and

column 9, lines 1-14 and column 11, lines 56-67 discloses minimizing residual error (distortion) in the QAM signal using a DDE algorithm which corresponds to a means for performing a decision directed equalization (DDE) of the QAM signal.

De Latremange does not disclose a mean for performing a frequency sweep to increase acquisition bandwidth of a carrier recovery loop, wherein the frequency sweep is used if a frequency offset of the acquired QAM signal is greater than the acquisition bandwidth of the carrier recovery loop.

However, Yoshihara discloses a sweep controller (see Fig. 2, block 13) for performing a frequency sweep to increase sychronziation bandwidth (range) (see Abstract and column 1, lines 7-12) of a carrier recovery loop (see Fig. 2, block 201, column 3, lines 29-32), wherein the frequency sweep controller is used to generate a sweep signal if a frequency offset of a beat frequency of an acquired signal is greater than the upper limit bandwidth of the loop filter of the carrier recovery loop (see column 4, lines 46-63) which represents the acquisition bandwidth of

the carrier recovery loop. Therefore, it would have been obvious to one skilled in the art to modify the apparatus of de Latremange with the frequency sweep as disclosed by Yoshihara in order to broaden the synchronization capture range and remove false synchronization (see Yoshihara, column 1, lines 7-12).

Regarding claim 31, de Lantremange discloses the means for performing the symbol timing recovery of the input QAM signal further includes: a means for adjusting a sampling clock of the symbol timing recovery loop (column 17, lines 11-17).

Regarding claim 32, de Lantremange discloses the means for performing the Blind Equalization of the QAM signal without carrier lock further includes: a means for minimizing a dispersion error of the received QAM signal constellation as compared with an error-free QAM signal constellation (Fig. 1A, block 32, see column 10, lines 1-14, wherein the dispersion error is minimized using the Multiple Constellation Partition Algorithm to match output of the modulator shaping filter (error-free signal constellation) with output of the adaptive filter as described in column 1, lines 58-67).

Regarding claim 33, de Lantremange discloses the means for minimizing the dispersion error of the received QAM signal constellation as compared with the error-free QAM signal constellation further includes: a means for adjusting a set of coefficients of an equalizer (see column 10, lines 1-20, wherein Equation 6 updates coefficients to minimize dispersion as disclosed in column 10, lines 1-20).

Regarding claim 34, de Lantremange discloses the means for performing the decision directed equalization (DDE) of the QAM signal further includes: a means for updating a set of coefficients of the equalizer (see column 11, lines 56-column 12, line 5, wherein LMS is a

decision directed algorithm which uses Equation 10 to also update coefficients in the same manner as Equation 6).

Regarding claim 35, de Lantremange discloses the means for performing the decision directed equalization (DDE) of the QAM signal further includes: a DDE algorithm (see column 9, lines 1-14).

7. Claims 1, 4-8, 10, 16, and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (previously cited in Office Action 5/11/2006) in view of Zhu et al. (previously cited in Office Action 5/11/2006) and in further view of Yohsihara (U. S. Patent No. 4, 871, 973).

Regarding claim 1, de Lantremenge discloses a method of automated acquisition of a QAM signal (column 1, lines 13-17 and column 6, lines 6-15, wherein reception is acquisition), the method employing a state machine (Fig. 1A, Table 2, column 25, lines 21-46) progressing from an initial state (STATE 0) to a final state (STATE 6); the state machine comprising: Fig. 1A, blocks 24, 26, 32, 34, and 36, which correspond to a symbol timing recovery loop (see column 17, lines 11-17, wherein adjusting the sampling clock of the resampler provides timing recovery) ; Fig. 1B which corresponds to a carrier loop; and Fig. 1A, block 32, which corresponds to an equalizer (see column 8, lines 35-44); the method comprising the steps of:

(Fig. 1A, block 28, column 7, lines 33-46) performing an automatic gain control (AGC) operation on the incoming QAM signal to maintain a steady amplitude (wherein amplitude corresponds to magnitude) of the QAM signal;

(Fig. 1A, blocks 24, 26, 32, 34, and 36, column 17, lines 11-17) performing a symbol timing recovery of the input QAM signal by adjusting a sampling clock (see column 17, lines 11-17) of the symbol timing recovery loop;

(Fig. 1A, block 32, column 8, lines 35-67) performing a Blind Equalization (see column 8, lines 61-67) of the QAM signal without carrier lock (wherein carrier lock is performed after the equalization in Fig. 1B) to minimize a dispersion error (see column 10, lines 1-15) of the received QAM signal constellation as compared with an error-free QAM signal constellation by adjusting a set of coefficients of the equalizer (wherein the dispersion error is reduced using the Multiple Constellation Partitions algorithm which updates (adjusts) the coefficients to minimize the dispersion error);

(Fig. 1B, column 19, line 54-column 20, line 27) performing a carrier recovery of the QAM signal to eliminate a residual carrier frequency error and to eliminate a phase error from the acquired QAM signal (wherein compensating for phase and timing offsets of the carrier allows carrier recovery); and

(column 9, lines 1-14 and column 11, lines 56-67) performing a decision directed equalization (DDE) of the QAM signal by updating a set of coefficients (see Equation 10 which discloses a coefficient update algorithm similar to Equation 6) of the equalizer by using a decision based algorithm.

De Lantremenge does not disclose the state machine includes a coarse frequency loop or performing a frequency sweep to increase acquisition bandwidth of a carrier recovery loop, wherein the frequency sweep is used if a frequency offset of the acquired QAM signal is greater than the acquisition bandwidth of the carrier recovery loop.

However, Zhu et al. discloses a coarse frequency loop (Fig. 2, blocks 1, 12, 18, 19, 24-26, and 31) which provides a coarse frequency estimate of a received signal (sections 0134-0136). The coarse frequency estimate is used to adjust the frequency of a received signal through Fig. 4, block 25 (see section 0142 and 0148) to compensate for a frequency offset. Therefore, it would have been obvious to one skilled in the art at the time invention was made to modify the method/device of de Lantremange with the coarse frequency loop of Zhu et al. to compensate for frequency offsets (section 0148) which could cause interchannel interference in the received signal (Zhu et al., section 0128).

Yoshihara further discloses a sweep controller (see Fig. 2, block 13) for performing a frequency sweep to increase sychronziation bandwidth (range) (see Abstract and column 1, lines 7-12) of a carrier recovery loop (see Fig. 2, block 201, column 3, lines 29-32), wherein the frequency sweep controller is used to generate a sweep signal if a frequency offset of a beat frequency of an acquired signal is greater than the upper limit bandwidth of the loop filter of the carrier recovery loop (see column 4, lines 46-63) which represents the acquisition bandwidth of the carrier recovery loop. Therefore, it would have been obvious to one skilled in the art to modify the method of de Latremange and Zhu et al. with the frequency sweep as disclosed by Yoshihara in order to broaden the synchronization capture range and remove false synchronization (see Yoshihara, column 1, lines 7-12).

Regarding claim 4, de Lantremange further discloses performing the automatic gain control (AGC) operation on the incoming QAM signal further includes the step of: causing the state machine to enter state 2 (column 25, lines 24-25) which corresponds to state 1B of the present invention, which includes estimating a frequency (timing) offset (see column 6 lines 16-

25). However, de Lantremange does not disclose the estimate of the frequency offset is a coarse frequency offset. However, Zhu et al. discloses a coarse frequency loop (Fig. 2, blocks 1, 12, 18, 19, 24-26, and 31) which provides a coarse frequency estimate of a received signal (sections 0134-0136). The coarse frequency estimate is used to adjust the frequency of a received signal through Fig. 4, block 25 (see section 0142 and 0148) to compensate for a frequency offset. Therefore, it would have been obvious to one skilled in the art at the time invention was made to modify the method/device of de Latremange. with the coarse frequency loop of Zhu et al. to compensate for frequency offsets (section 0148) which could cause interchannel interference in the received signal (Zhu et al., section 0128).

Regarding claim 5, Zhu et al. further discloses performing a coarse frequency estimation of a signal frequency drift over a long period (sections 0134-0136, wherein the large frequency estimation range corresponds to a long period of time and the longer the estimation, the more accurate the estimation as disclosed in section 0136) of time due to aging, temperature changes, humidity changes in order to obtain a set of frequency corrections (sections 0142, wherein the final measured frequency offset is the frequency correction), and to apply the set of frequency corrections to a set of frequency offsets in the coarse frequency loop (Fig. 4, block 25, section 0148). It would have been obvious to one skilled in the art to include this coarse frequency estimation as apart of the AGC operation since to compensate for frequency offsets (section 0148) which could cause interchannel interference in the received signal (Zhu et al., section 0128).

Regarding claim 6, de Lantermenge further discloses the step of performing the symbol timing recovery of the input QAM signal further comprises the step of: causing the state machine

to enter state "2" (column 25, lines 26-31), which corresponds to state 2 of the present invention, wherein in state 2, a symbol loop process adjusts a sampling clock to an ideal sampling point (see column 17, lines 11-17)

Regarding claim 7, de Lantermenge further discloses the step of performing the symbol timing recovery of the input QAM signal while the state machine stays in the state "2" further comprises the step of: adjusting the sampling clock of the symbol timing recovery loop and re-adjusting the sampling clock (Fig. 1A, block, 124, see column 17, lines 11-17) of the symbol timing recovery loop (Fig. 1A, blocks 24, 26, 32, 34, and 36) to optimize the symbol timing recovery of the input QAM signal by compensating for sampling clock offsets.

Regarding claim 8, de Lantermenge further discloses the step of performing the symbol timing recovery of the input QAM signal further comprises the step of: causing the state machine to enter state "3" (column 25, lines 26-31) which corresponds to state 3 of the present invention, which includes re-adjusting the symbol (sample) timing recovery each time a peak travels two tap positions in a filter (see column 18, lies 42-44).

Regarding claim 10, de Lantermenge further discloses the step of performing the Blind Equalization of the QAM signal without carrier lock further includes the step of: causing the state machine to enter state “2” (column 25, lines 36-31) which corresponds to state “4” of the present invention, which includes performing the Blind Equalization of the QAM signal without carrier lock which further includes: minimizing a dispersion error of the received QAM signal constellation as compared with an error-free QAM signal constellation (Fig. 1A, block 32, see column 10, lines 1-14, wherein the dispersion error is minimized using the Multiple

Constellation Partition Algorithm to match output of the modulator shaping filter (error-free signal constellation) with output of the adaptive filter as described in column 1, lines 58-67).

Regarding claim 16, de Lantremenge further discloses the step of performing the carrier recovery of the QAM signal further includes the step of: causing the state machine to enter state "2" (column 25, lines 36-51) which corresponds to state 6 of the present invention, wherein a carrier loop process without a frequency sweep is performed (Fig. 1B, column 19, line 54-column 20, line 27).

Regarding claim 18, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: causing the state machine to enter state "4" (column 25, lines 36-51) which corresponds to state 7 of the present invention, wherein coefficients are updates by a DDE algorithm using a step size coefficient (Equation 10, wherein μ denotes a step size as shown in Table 3) in the DDE algorithm (wherein LMS is a DDE algorithm as disclosed in column 9, lines 1-14).

Regarding claim 19, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: using a step size coefficient (Equation 10, wherein μ denotes a step size as shown in Table 3) in the DDE algorithm (wherein LMS is a DDE algorithm as disclosed in column 9, lines 1-14) to determine the error feedback (see column 9, lines 1-14) from the carrier loop (wherein the error estimator 52 is apart of the carrier loop of Fig. 1B) the error to the equalizer.

Regarding claim 20, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: causing the state machine to enter state "4" (column 25, lines 36-51) which corresponds to state 8 of the present

invention, which includes re-adjusting a step size coefficient (Equation 10, wherein μ denotes a step size as shown in Table 3, and Equation 10 is a coefficient update algorithm similar to Equation 6) in the DDE algorithm (wherein LMS is a DDE algorithm as disclosed in column 9, lines 1-14) to optimize the error feedback (see column 9, lines 1-14).

Regarding claim 21, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: re-adjusting a step size coefficient (Equation 10, wherein μ denotes a step size as shown in Table 3, and Equation 10 is a coefficient update algorithm similar to Equation 6) in the DDE algorithm (wherein LMS is a DDE algorithm as disclosed in column 9, lines 1-14) to optimize the error feedback (see column 9, lines 1-14) from the carrier loop (wherein the error estimator 52 is apart of the carrier loop of Fig. 1B) the error to the equalizer.

Regarding claim 22, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: causing the state machine to enter state "7" (column 25, lines 36-51) which corresponds to state 9 of the present invention, which is the final state according to Table 2.

Regarding claim 23, de Lantremange further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of tracking the QAM signal by updating (re-adjusting) the step size coefficient in the DDE (LMS) algorithm (see Equation 10, wherein a component of the coefficient update algorithm is produce by the carrier tracking system).

Regarding claim 24, de Lantremenge further discloses cycling the state machine back to state (column 25, lines 56-59), wherein the state machine is recycled to state 0 (reset) based on an error.

8. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (previously cited in Office Action 5/11/2006) in view of Zhu et al. (previously cited in Office Action 5/11/2006) in view of Yoshihara (4, 871, 973) as applied to claims 7 and 16, and in further view of Fukuoka et al. (previously cited in Office Action 5/11/2006).

Regarding claim 9, de Lantremange, Zhu et al., and Yoshihara do not disclose the symbol timing operation of the state machine includes re-adjusting a set of frequency coefficients and re-adjusting a set of phase coefficients of the symbol loop to optimize the symbol timing recovery.

However, Fukuoka et al. discloses at Fig. 1, blocks 30, 41, and 42, column 3, lines 41-52 and column 6, lines 61-67 adjusting and re-adjusting (updating) a set of phase coefficients and a set of frequency coefficients in an automatic frequency/phase control loop to remove frequency and phase errors from a received QAM signal. (see Figs. 11 and 12, column 4, lines 31-34). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange, Zhu et al., and Yohsihara with the frequency and phase adjustment of Fukuoka et al. since Fukuoka et al. states the frequency and phase adjustment corrects frequency and phase errors simultaneously (column 6, line 61-column 7, line 8).

Regarding claim 17, de Lantremange, Zhu et al., and Yoshihara do not disclose the carrier recovery operation of the state machine includes re-adjusting the set of frequency

coefficients and the set of phase coefficients of the carrier loop to optimize the carrier acquisition of the QAM signal.

However, Fukuoka et al. discloses at Fig. 1, blocks 30, 41, and 42, column 3, lines 41-52 and column 6, lines 61-67 adjusting (updating) a set of phase coefficients and a set of frequency coefficients in an automatic frequency/phase control loop to remove frequency and phase errors from a received QAM signal to restore (acquire) original carrier waves (column 1, lines 38-44). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange, Zhu et al., and Yoshihara with the frequency and phase adjustment of Fukuoka et al. since Fukuoka et al. states the frequency and phase adjustment corrects frequency and phase errors simultaneously (column 6, line 61-column 7, line 8).

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (previously cited in Office Action 5/11/2006) in view of Zhu et al. (previously cited in Office Action 5/11/2006) in view of Yoshihara (U. S. Patent No. 4, 871, 973) as applied to claim 10, and in further view of Li (previously cited in Office Action 5/11/2006).

Regarding claim 11, de Lantremange, Zhu et al., and Yoshihara do not disclose the blind equalization operation of the state machine includes substantially continuously performing a modulus update of the set of equalizer coefficients.

However, Li discloses at column 3, line 26-column 4, line 8 for blind equalization, using a cost function to perform a modulus update of coefficients used in an adaptive equalizer to equalize a QAM signal constellation. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange, Zhu et al.,

and Yoshihara with the coefficient update as taught by Li since Li states the modulus update increases the rate of convergence of the tap weights (coefficients), see column 8, lines 50-65.

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (previously cited in Office Action 5/11/2006) in view of Zhu et al. (previously cited in Office Action 5/11/2006) in view of Yoshihara (U. S. Patent No. 4, 871, 973) as applied to claim 24, and in further view of McBurney (previously cited in Office Action 5/11/2006).

Regarding claim 25, de Lantremange, Zhu et al., and Yoshihara do not disclose the state machine is reset is state "0" (see Table 2, STATE 0), but fail to disclose re-acquiring a lost QAM signal while the state machine stays in state "0".

However, McBurney discloses re-acquiring a GPS signal which is lost due to obstruction of the signal (column 1, lines 16-28), wherein the GPS can be a QAM signal (column 2, line 65-column 3, line 10). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange, Zhu et al., and Yoshihara with re-acquisition of a lost signal as taught by McBurney since McBurney states the lost signal should be reacquired as quickly as possible so that the least operational time in the device is lost (column 1, lines 26-29).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jones et al. (U. S. Patent No. 4, 724, 437) and Sadowski (U. S. Patent No. 6, 016, 069) both discloses increasing acquisition bandwidth using frequency sweeping.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Curtis Odom
November 25, 2006